

# A ZigBee-Based Wireless Sensor Network for Continuous Sound and Noise Level Monitoring on the ISS, Phase I

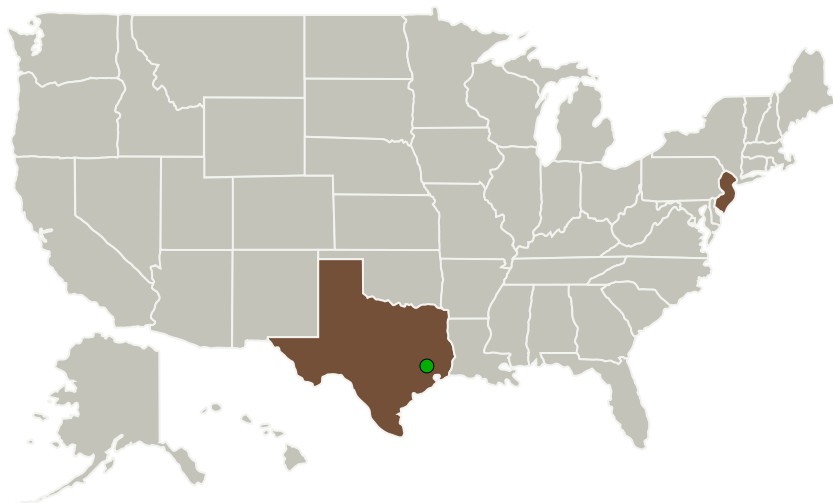
Completed Technology Project (2011 - 2011)



## Project Introduction

Acoustic survey is now performed using hand-held devices once every two months on the international space station (ISS). It takes quite a lot of precious crew time and the sporadic monitoring program is not adequate. This Phase I proposal is concerned with developing an automated sound level and noise exposure monitoring system running on a ZigBee-compliant wireless sensor network. In the proposed research, we will focus on a preliminary design of the monitoring terminal that integrates the functionalities of microphone, data sampling, and signal processing along with data communication through a ZigBee wireless channel. Sufficient compliance of the developed sound level meter and noise dosimeter with the related ANSI standards will be tested and demonstrated. This plan takes advantage of our broad knowledge in acoustic signal processing and ZigBee wireless sensor network, and will benefit from our experience and skills with the development of embedded digital signal processing systems using either FPGA (field programmable gate array) or DSP (digital signal processor). The Phase I effort will provide a foundation for prototype design to be conducted in Phase II.

## Primary U.S. Work Locations and Key Partners



A ZigBee-Based Wireless Sensor Network for Continuous Sound and Noise Level Monitoring on the ISS, Phase I

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

# A ZigBee-Based Wireless Sensor Network for Continuous Sound and Noise Level Monitoring on the ISS, Phase I

Completed Technology Project (2011 - 2011)



Organizations Performing Work	Role	Type	Location
WEVOICE, Inc.	Lead Organization	Industry Women-Owned Small Business (WOSB)	Bridgewater, New Jersey
● Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

## Primary U.S. Work Locations

New Jersey	Texas
------------	-------

## Project Transitions

**February 2011:** Project Start**August 2011:** Closed out

**Closeout Summary:** A ZigBee-Based Wireless Sensor Network for Continuous Sound and Noise Level Monitoring on the ISS, Phase I Project Image

### Closeout Documentation:

- Final Summary Chart Image(<https://techport.nasa.gov/file/140160>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

WEVOICE, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

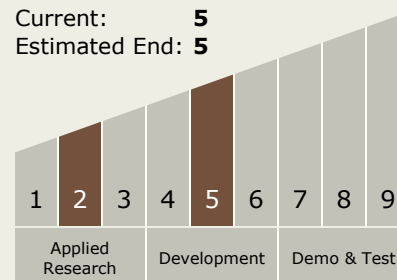
Carlos Torrez

### Principal Investigator:

Yiteng (arden) Huang

## Technology Maturity (TRL)

Start: 2  
Current: 5  
Estimated End: 5



# A ZigBee-Based Wireless Sensor Network for Continuous Sound and Noise Level Monitoring on the ISS, Phase I

Completed Technology Project (2011 - 2011)



## Technology Areas

### Primary:

- TX10 Autonomous Systems
  - └ TX10.2 Reasoning and Acting
    - └ TX10.2.5 Fault Diagnosis and Prognosis

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System